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While negative phototropism in *Diaptomus* can be reversed by acids, positive phototropism brought about by chemical means can not be reversed by strychnin (atropin or caffein).*

A. R. MOORE

THE UNIVERSITY OF CALIFORNIA,
July 8, 1913

THE POWDERY SCAB OF POTATO (*SPONGOSPORA SOLANI*) IN MAINE

THE potato tuber scab caused by *Spongospora Solani* (Brunch) has been known in Europe since 1842. It was recently reported from Canada by Güssow,¹ but has hitherto not been found in the United States. That it would become established here has been feared by those acquainted with the serious injuries it causes in Great Britain, whence heavy importations of potatoes were made in 1911 and previous years, to supply American markets.

The writer discovered this disease on June 23 in potatoes just brought to Houlton from Presque Isle, Aroostook County, Maine. There is no probability as yet that a large amount of *Spongospora* exists there, but 84 diseased tubers were sorted out of four barrels, which represented a lot of 500 barrels.

The milder forms of powdery scab resemble the common Oospora scab. The pustules are at first closed, but later break out into large open sori. Twenty-six of the tubers collected showed this form.

The source of the disease is not known. The original infection may have been brought from Europe before the Plant Quarantine Act went into effect or seed potatoes bearing the disease may have come from the adjacent province of New Brunswick, in Canada, where powdery scab already occurs.

It is hoped that pathologists all over the country will now watch for this disease and that every effort be made to stamp it out.

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* Moore, A. R., loc. cit.

¹ *Phytopathology*, February, 1913, p. 18.

A NEW SECTION SOUTH FROM DES MOINES, IOWA

THE grading of a new railroad line from Des Moines to Allerton, passing from Polk County through Warren, Marion and Lucas into Wayne County, affords an excellent series of exposures such as have never before been available in this region. The relation which this series makes evident assists in the interpretation of observations already recorded, and the section itself serves as a standard with which to compare work yet to be accomplished in south central Iowa and adjacent Missouri. The general relation will be of interest to all who keep informed on the Pleistocene work of the country.

The Loess

The best exposure of loess that the writer has seen in this portion of the state is south of Des Moines, half a mile north of Coon Valley. Here twelve to fifteen feet of grayish yellow porous loess with faint horizontal lamination may be seen capping the bluff for a quarter of a mile. At the two ends of the cut the loess is exceedingly fossiliferous, and charged with concretions. In the hills east of Carlisle, even as far as Hartford, a distinct fossiliferous loess may be seen; but further south it does not form a conspicuous deposit. On the brow of hills away from the highest portion of the upland it is not present at all.

The "Gumbo"—The Loveland

Along the sides of all cuts through the upland may be seen a clay yellowish above, bluish below, of a thickness varying from a few feet up to perhaps twenty feet. It is nearly free from pebbles, but here and there a few scattered ones may be found that are half an inch in diameter, and very rarely one as large as an inch. Two were recently found as large as two inches in diameter. There are found scattered through the clay grains chiefly of granite about an eighth of an inch in diameter. The clay is generally free from distinct stratification, often silty in appearance, and slumps badly throughout the entire length of the railroad. In the upland where thickest it is found on the boulder and pebble-bearing portion of the Kansan drift with no

intervening plane of oxidation; but in places, and apparently at lower levels, a line of scattered pebbles is sometimes evident. In other places at still lower levels the plane of separation is marked by boulders and a yellowish oxidized surface of the boulder-bearing portion of the Kansan, the horizon that is so commonly seen in Warren, Madison and Lucas counties, which appearance led Bain to coin the term "ferretto." Here and there the deposit is replaced by beds of stratified sand revealing places of current action.

This is the deposit which McGee called the "gumbo" of southern Iowa. Perhaps there is no more important relation brought to light in the entire series of exposures than the relation of this common deposit for this part of the state. It is so free from pebbles, weathers so quickly, and forms a soil so like that formed from loess that it has by some (including myself) been judged to be a modified loess; but these excellent extensive exposures of the deposit in many variations leave no chance to doubt the conclusion that this "gumbo" is not a loess, but is related to the Kansan drift and deposited in the closing stages of the Kansan invasion.

The writer has thus far looked in vain for evidences of kames and drumlins. He has also in previous years endeavored to trace the boundaries of this same "gumbo" to ascertain whether it thinned out as if in basins, but found it through the upland and dissected by ravines. A main difficulty has been to distinguish between a low-ground gumbo and an upland gumbo, which were apparently connected along the sides of the large ravines. The sides of these new railroad cuts and the various excavations in low ground reveal such mixture and gradation due to wash and creep, in which stratification due to wash has not persisted, that it now seems necessary to recognize this form of low-ground gumbo as not contemporaneous with the upland gumbo, but largely derived from it. However, gumbo ten to twenty feet above the surface of the river valleys is found banked in against and on the Kansan drift, and apparently identical with the upland gumbo. (Such is the deposit

at the Siegel Brick and Tile Works at Osceola.)

In the deep cut east of Sandyville the deposits above the boulder-bearing portion of the Kansan drift are in two portions: a lower portion six feet thick and an upper portion one to two feet thick. The surface of this lower portion contains hemispherical depressions three to five feet in diameter filled with clay of the upper portion. It is probable that this irregular surface was due to a slight final movement of the ice before the last of the Kansan ice disappeared. No pebbles are found in the depressions, as might be expected if the depressions were potholes, and the cross sections are too rounded to appear due to stream erosion. The whole appearance suggests moulding by overriding ice.

Hitherto the oxidized portion of the Kansan drift found at a depth of thirty feet from the surface in wells of the upland, seen as the upper level of the "ferretto" at the same distance below the upland on so many hillsides, and marked on others as close to the bottom of the upland gumbo, was judged to be the oxidized surface of the Kansan plain, so conspicuous throughout south central Iowa, the gumbo itself being then considered a later deposit on this plain. Classing this gumbo as related to the Kansan drift rather than to the post-Kansan deposits raises the supposed level of this Kansan ground moraine by an amount equal to the thickness of the "gumbo," twenty to thirty feet, and supplies that much of uneroded material that in places could well have been surface settlements on the upland of the extensive Kansan plain as the Kansan ice gradually disappeared; in other places a deposit in hollows on the surface; in other places not deposited at all, or eroded since deposition.

On comparing the evidence revealed in this series of railroad cuts with the description which Professor B. Shimek gives of the "Loveland" found along the Missouri River in the western part of the state, announced in the *Bulletin of the Geological Society of America*, 1910, in *SCIENCE*, 1910, and very fully described in his "Geology of Harrison and Monona Counties," volume 20, Iowa Geo-

logical Survey, it is evident that this "gumbo" corresponds to his "Loveland," which he has found there well exposed and widely distributed, and has been the first to recognize.

The Boulder-bearing Portion of the Kansan

At the fine exposure at Coon Valley only a trace of Kansan boulder-bearing clay is left; but it appears in all the deep cuts to the south. The characteristics of this portion of the drift have been so frequently stated that a description is here omitted. South of Whitebreast Creek and across Lucas County numerous sand boulders form a conspicuous feature of the Kansan boulder clay. In places, where "gumbo" is not present, there is evidence of post-Kansan wash.

No Aftonian nor Nebraskan Exposed

The study of the section was undertaken with the expectation that numerous exposures of Aftonian interglacial deposits and of Nebraskan drift (sub-Aftonian) would be found; but the cuts are through the hills, and fills extend across the valleys. At the Avon gravel pit in the southern part of Polk County a steam shovel is now removing a coarse sand close to a level at which near by mastodon or elephant remains are said to have been found a number of years ago. These deposits are thought to be of Aftonian age. In a cut in Marion County the bottom of the Kansan drift there exposed contained a boulder of blue clay apparently Nebraskan. With the exception of these two places all evidence of distinct Aftonian and of distinct Nebraskan is wanting. (The work of excavation is not fully completed near the southern part of Marion County.)

The Des Moines Formation

The Des Moines shales are frequently found above the level of the track bed from the outcrop near Coon Valley to the northern boundary of Lucas County, south of which place they appear but once. These exposures afford excellent opportunity to study variations in a preglacial surface.

The exposures in their present perfection will not last long, but at present they will well repay a day's tramp south from Des Moines, or, at Chariton, north from Chariton River.

Acknowledgments

During the summer several of the most important exposures were visited by Professors George F. Kay, B. Shimek and James H. Lees together with the writer, and the conditions found discussed in the field; but the parties named are not responsible in any way for the above presentation.

JOHN L. TILTON.

THE AMERICAN ASSOCIATION OF MUSEUMS

THE eighth annual meeting of the American Association of Museums was held in Philadelphia, June 3-5. The most prominent feature of the convention was the discussion of general questions of policy in relation to future work.

The representation of museums of science in the membership has always largely exceeded that of museums of art, although the essential idea in the organization of the association was to afford a common meeting ground for the discussion of the "principles of organization and administration of museums, and their problems of technique, rather than matters of art, history or science as such." There is a strong sentiment among both science and art members that, since all museums exist for the purpose of giving visual expression to ideas, the methods of accomplishing this purpose must be fundamentally similar and vary only in application according to the nature of the material and of the ideas to be expressed. The field of the association, therefore, in no way conflicts with any of the many scientific, artistic or historical societies. For the purpose of promoting a more general appreciation of these facts, and to endeavor to secure greater equality of representation of the various classes of museums in the membership and in the programs of the meetings, a special committee was appointed. With an art man as president for the ensuing year, the time seems particularly opportune for this movement which is so essential to the full function of the association.

A committee was also appointed to consider what methods the association may adopt to promote the increase and successful development of